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09/533,517	03/23/2000	Zhanhe Shi	CISCO-1254	3821

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EXAMINER	
RYMAN, DANIEL J	

ART UNIT	PAPER NUMBER
2665	

DATE MAILED: 03/09/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/533,517	SHI ET AL.	
	Examiner	Art Unit	
	Daniel J. Ryman	2665	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *03 February 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-75* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-75* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

1. Applicant's arguments filed 2/3/2005 have been fully considered but they are not persuasive. Applicant argues that Ganz does not disclose that the sequence indicates an order in which each of said input interface queues should be polled during a single polling cycle. Examiner, respectfully, disagrees. Ganz teaches that the polling sequence is adapted according to the rate of packet arrival on each queue (col. 3, lines 20-34; col. 4, lines 39-44; col. 8, line 17-col. 9, line 63; and col. 14, lines 3-15). Here a particular queue with a high data rate will be polled more frequently during a polling cycle than a queue with a low data rate (col. 3, lines 20-34; col. 4, lines 39-44; col. 8, line 17-col. 9, line 63; and col. 14, lines 3-15). In the example polling sequence, shown in col. 8, line 17-col. 9, line 63, the polling sequence polls session 5 and session 6 twice during the polling cycle. Given that the polling sequence is modified according to data rates, these excess polls can be dynamically changed in order to accommodate sessions with a higher data rate (col. 3, lines 20-34; col. 4, lines 39-44; col. 8, line 17-col. 9, line 63; and col. 14, lines 3-15). As such, during each polling cycle, the polling sequence will vary where the sequence indicates an order in which each of said input interface queues should be polled during a single polling cycle. Therefore, Examiner maintains that Ganz reads on the newly added limitation.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person

having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 1-3, 6-8, 11-13, 16-18, 21-23, 26-28, 31-48, 51-59, 61, 62, 64, 65, 67, and 68-75 are rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant's Admitted Prior Art in view of Chao et al. (USPN 5,007,070) in further view of Ganz et al (USPN 6,049,549).

4. Regarding claims 1, 11, 21, 31, 59, 62, 65, and 68, Applicant admits as prior art a method and apparatus for controlling congestion (Figs. 1-3 and page 1, line 15-page 7, line 20) in a networking device having a plurality of input interface queues (Figs. 1-3 and page 1, line 15-page 7, line 20), comprising the steps of and means for: estimating, in each sampling state, data arrival rate (number of packets received) for each of the plurality of input interface queues with respect to incoming data packets received on corresponding input interfaces, and obtaining a set of estimated arrival rates for the plurality of the input interface queue (Figs. 1-3 and page 1, line 15-page 7, line 20, esp. page 5, lines 13-17); determining, for each polling state associated with a respective sampling state, the sequence in which the plurality of input interface queues should be polled (page 5, lines 13-17) and the quantity of data to be processed from each of the plurality of input interface queues each time the input interface queue is polled (Figs. 1-3 and page 1, line 15-page 7, line 20, esp. page 5, lines 13-17); and polling, in each polling state, the plurality of the input interface queues in accordance with the determined sequence and quantity (Figs. 1-3 and page 1, line 15-page 7, line 20).

Applicant does not expressly disclose using the set of estimated data arrival rates of the plurality of input interface queues to determine the quantity of data to be processed from each of the plurality of input interface queues each time the input interface queue is polled. Chao teaches, in a packet transmission system, estimating the arrival rate in a buffer and using the

estimated arrival rate to determine the transmission rate from the buffer in order to avoid underflow and overflow of the buffer (col. 3, lines 32-51). Thus, it would have been obvious to one of ordinary skill in the art at the time of the invention to use the set of estimated data arrival rates of the plurality of input interface queues to determine, for each polling state associated with a respective sampling state, the quantity of data to be processed from each of the plurality of input interface queues each time the input interface queue is polled in order to ensure that the queue does not overflow or underflow.

Applicant in view of Chao does not expressly disclose using the set of estimated data arrival rates of the plurality of input interface queues to determine, for each polling state associated with a respective sampling state, the sequence in which the plurality of input interface queues should be polled each time the input interface queue is polled, wherein the sequence indicates an order in which each of said input interface queues should be polled during a single polling cycle. Ganz discloses, in a polling system, determining, for each polling state, the sequence in which the plurality of inputs should be polled using the estimated data rate on each of the plurality of inputs (col. 3, lines 20-34; col. 4, lines 39-44; col. 8, line 17-col. 9, line 63; and col. 14, lines 3-15) wherein the sequence indicates an order in which each of said input interface queues should be polled during a single polling cycle (col. 3, lines 20-34; col. 4, lines 39-44; col. 8, line 17-col. 9, line 63; and col. 14, lines 3-15); polling, in each polling state, the plurality of the inputs in accordance with the determined sequence (col. 3, lines 20-34; col. 4, lines 39-44; col. 8, line 17-col. 9, line 63; and col. 14, lines 3-15); and updating the sequence used in said polling by repeating said determining and said polling with a desired cycle (col. 3, lines 20-34; col. 4, lines 39-44; col. 8, line 17-col. 9, line 63; and col. 14, lines 3-15). Ganz does this in order

to avoid unnecessarily using bandwidth by excessively polling the inputs (col. 3, lines 20-34; col. 4, lines 39-44; col. 8, line 17-col. 9, line 63; and col. 14, lines 3-15). In addition, although Ganz discloses the polling system is used in conjunction with polling of wireless devices, Ganz also discloses that the polling method can be used for a variety of different systems (col. 14, lines 3-15). It would have been obvious to one of ordinary skill in the art at the time of the invention to use the set of estimated data arrival rates of the plurality of input interface queues to determine, for each polling state associated with a respective sampling state, the sequence in which the plurality of input interface queues should be polled each time the input interface queue is polled wherein the sequence indicates an order in which each of said input interface queues should be polled during a single polling cycle in order to unnecessarily avoid using bandwidth by excessively polling the inputs.

5. Regarding claims 2, 12, 22, and 47, Applicant in view of Chao in further view of Ganz suggests that the data arrival rate on each of the plurality of input interface queues is estimated based on the static link capacity of the interface queue (Chao: col. 3, lines 48-51) where the data arrival rate will match the link capacity of the interface queue if the arrival rate does not fill the buffer beyond ¾ or less than ¼ of the buffer.

6. Regarding claims 3, 13, 23, and 48, Applicant in view of Chao in further view of Ganz suggests that the data arrival rate on each of the plurality of input interface queues is estimated based on a dynamically updated measurement (Chao: col. 3, lines 32-51 and Ganz: col. 2, lines 45-55; col. 2, lines 64-67; col. 3, lines 20-34; col. 10, lines 52-56; and col. 10, line 66-col. 11, line 27).

7. Regarding claims 6-8, 16-18, 26-28, and 51, Applicant in view of Chao in further view of Ganz discloses that said networking device is a router (Applicant: page 5, line 1).

8. Regarding claims 32, 34, 36, and 52, Applicant in view of Chao in further view of Ganz implicitly discloses that said estimating the data arrival rate is performed sequentially with respect to said determining the sequence and the quantity (Chao: col. 3, lines 32-51 and Ganz: col. 3, lines 20-34; col. 4, lines 39-44; col. 8, line 17-col. 9, line 63; and col. 14, lines 3-15) since the data arrival rate needs to be known in order to determine the sequence and quantity.

9. Regarding claims 33, 35, 37, and 53, Applicant in view of Chao in further view of Ganz suggests that said estimating the data arrival rate is performed independently with respect to said determining the sequence and the quantity (Applicant: page 5, lines 11-17 and Ganz: col. 3, lines 20-34; col. 4, lines 39-44; col. 8, line 17-col. 9, line 63; and col. 14, lines 3-15).

10. Regarding claims 38-46 and 54, Applicant in view of Chao in further view of Ganz discloses that the rate at which data are processed from each of the plurality of input interface queue is proportional to the data arrival rate on each input interface queue (Chao: col. 3, lines 32-51 and Ganz: col. 3, lines 20-34; col. 4, lines 39-44; col. 8, line 17-col. 9, line 63; and col. 14, lines 3-15) where the ratio of the data arrival rate to the processing rate, even if not constant, will give the proportional relationship between these two values.

11. Regarding claims 55-58, 61, 64, and 67, Applicant in view of Chao in further view of Ganz suggests that each sampling state has a first selected time interval, and each determining and polling state has a second selected time interval (Applicant: page 5, lines 11-17 and Ganz: col. 3, lines 20-34; col. 4, lines 39-44; col. 8, line 17-col. 9, line 63; and col. 14, lines 3-15).

12. Regarding claims 69 and 71, Applicant in view of Chao in further view of Ganz discloses that said determining includes: recalculating the sequence for each polling state based on the set of estimated data arrival rates (Applicant: page 5, lines 11-17 and Ganz: col. 3, lines 20-34; col. 4, lines 39-44; col. 8, line 17-col. 9, line 63; and col. 14, lines 3-15).

13. Regarding claims 70 and 72-75, Applicant in view of Chao in further view of Ganz suggests that said estimating includes: polling each of the plurality of input interface queues in a predetermined sequence (Applicant: page 5, lines 11-17); obtaining a sum of lengths of new incoming data packets which have arrived on each input interface queue since the last time the input interface queue was polled (Applicant: page 5, lines 11-17); and calculating the estimated data arrival rate for each input interface queue based on the sum and time that elapsed since the last time the input interface queue was polled (Applicant: page 5, lines 11-17 and Chao: col. 3, lines 32-51) where Chao discloses determining the input rate and Applicant discloses that the number of bits entered per unit time (polling round) is determined such that it would have been obvious to calculate the estimated data arrival rate for each input interface queue based on the sum and time that elapsed since the last time the input interface queue was polled.

14. Claims 4, 5, 9, 10, 14, 15, 19, 20, 24, 25, 29, 30, 49, 50, 60, 63, and 66 are rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant's Admitted Prior Art in view of Chao et al. (USPN 5,007,070) in further view of Ganz et al (USPN 6,049,549) as applied to claims 1, 11, 21, and 31 above, and further in view of Hanko et al (USPN 6,438,141).

15. Regarding claims 4, 5, 14, 15, 24, 25, 49, and 50, Applicant in view of Chao in further view of Ganz does not expressly disclose that the data arrival rate on each of the plurality of input interface queue is estimated using an exponential averaging function based on a constant

factor and on the difference in arrival times between a current data packet and a previous data packet into the input interface queue; however, Applicant in view of Chao in further view of Ganz does disclose estimating the data arrival rate on each of the plurality of input interface queues (Applicant: page 5, lines 11-17; Chao: col. 3, lines 32-51; and Ganz: col. 2, lines 45-55; col. 2, lines 64-67; col. 3, lines 20-34; col. 10, lines 52-56; and col. 10, line 66-col. 11, line 27). Hanko discloses having the data arrival rate on each of the plurality of inputs be estimated using an exponential averaging function based on a constant factor and on the difference in arrival times between a current data packet and a previous data packet in order to predict future bandwidths in a manner that allows for any desired statistical measure of data rates (col. 4, lines 44-59). It would have been obvious to one of ordinary skill in the art at the time of the invention to use an exponential averaging function based on a constant factor and on the difference in arrival times between a current data packet and a previous data packet in order to predict future bandwidths in a manner that allows for any desired statistical measure of data rates.

16. Regarding claims 9, 10, 19, 20, 29, and 30, Applicant in view of Chao in further view of Ganz in further view of Hanko discloses that said networking device is a router (Applicant: page 5, line 1).

17. Regarding claims 60, 63, and 66, Applicant in view of Chao in further view of Ganz does not expressly disclose that said estimating a current data arrival rate uses a previous data arrival rate estimated in a previous sampling state; however, Applicant in view of Chao in further view of Ganz does disclose estimating the data arrival rate on each of the plurality of input interface queues (Applicant: page 5, lines 11-17; Chao: col. 3, lines 32-51; and Ganz: col. 2, lines 45-55; col. 2, lines 64-67; col. 3, lines 20-34; col. 10, lines 52-56; and col. 10, line 66-col. 11, line 27).

Hanko discloses having the data arrival rate on each of the plurality of inputs be estimated using an exponential averaging function based on a previous arrival rate in order to predict future bandwidths in a manner that allows for any desired statistical measure of data rates (col. 4, lines 44-59). It would have been obvious to one of ordinary skill in the art at the time of the invention to estimate a current data arrival rate useing a previous data arrival rate estimated in a previous sampling state in order to predict future bandwidths in a manner that allows for any desired statistical measure of data rates

Conclusion

18. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Gopal et al (USPN 5,889,963) see entire document which pertains to polling interactive communication. Allpress et al. (USPN 5,920,552) see col. 1, line 67-col. 2, line 6 which pertains to increasing the rate from a buffer to avoid overflow. Coverdale et al. (USPN 6,373,842) see col. 10, lines 38-47 which pertains to increasing the rate from a buffer to avoid overflow.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Daniel J. Ryman whose telephone number is (571)272-3152. The examiner can normally be reached on Mon.-Fri. 7:00-4:30 with every other Friday off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Huy Vu can be reached on (571)272-3155. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Daniel J. Ryman
Examiner
DJR. Art Unit 2665

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